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FIG.1A

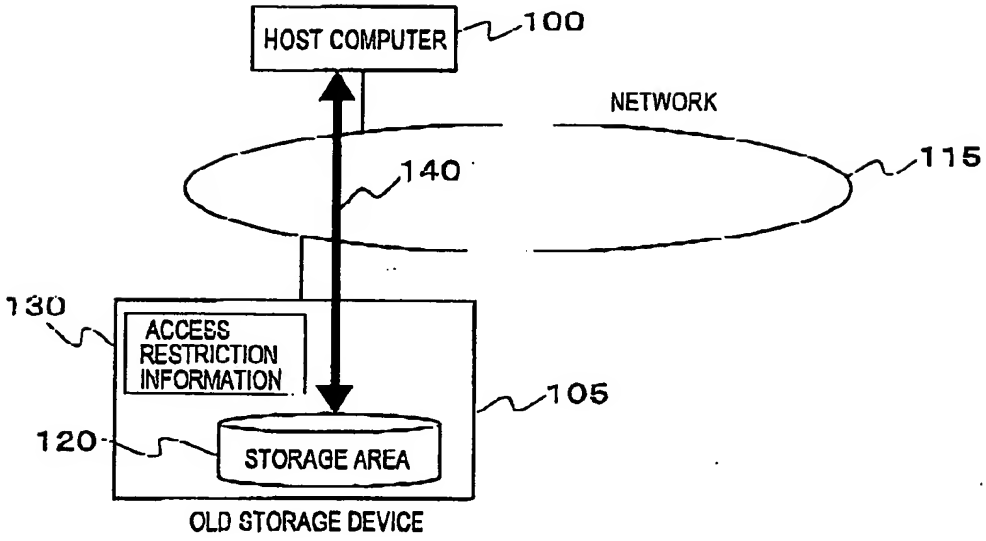

HOST COMPUTER
100
NETWORK
115
140
130
ACCESS RESTRICTION INFORMATION
105
120
STORAGE AREA
OLD STORAGE DEVICE

FIG.1B

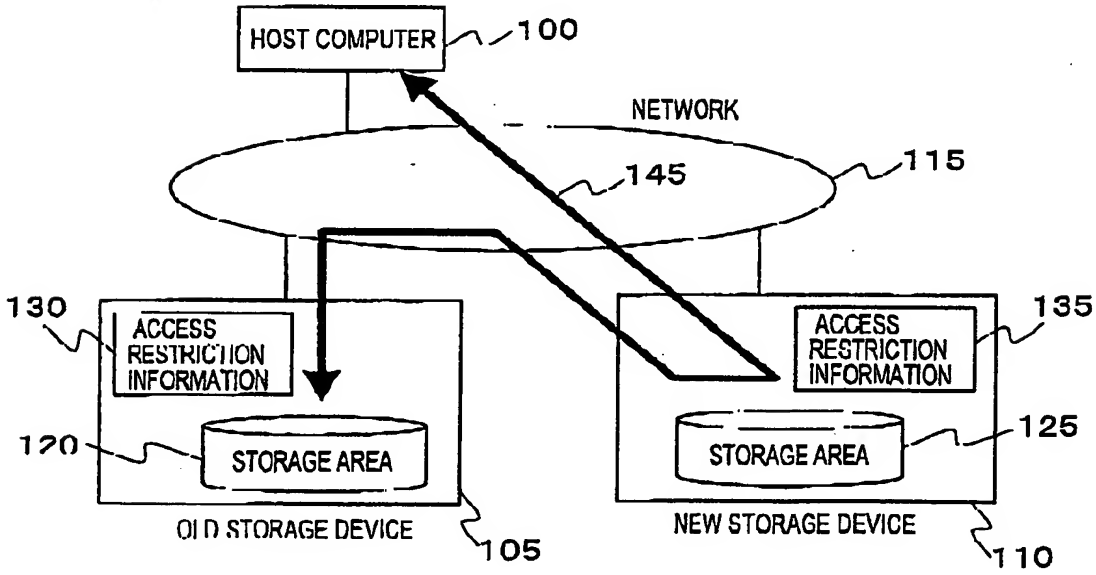

HOST COMPUTER
100
NETWORK
145
115
130
ACCESS RESTRICTION INFORMATION
120
STORAGE AREA
OLD STORAGE DEVICE
105
135
ACCESS RESTRICTION INFORMATION
125
STORAGE AREA
NEW STORAGE DEVICE
110

FIG.2

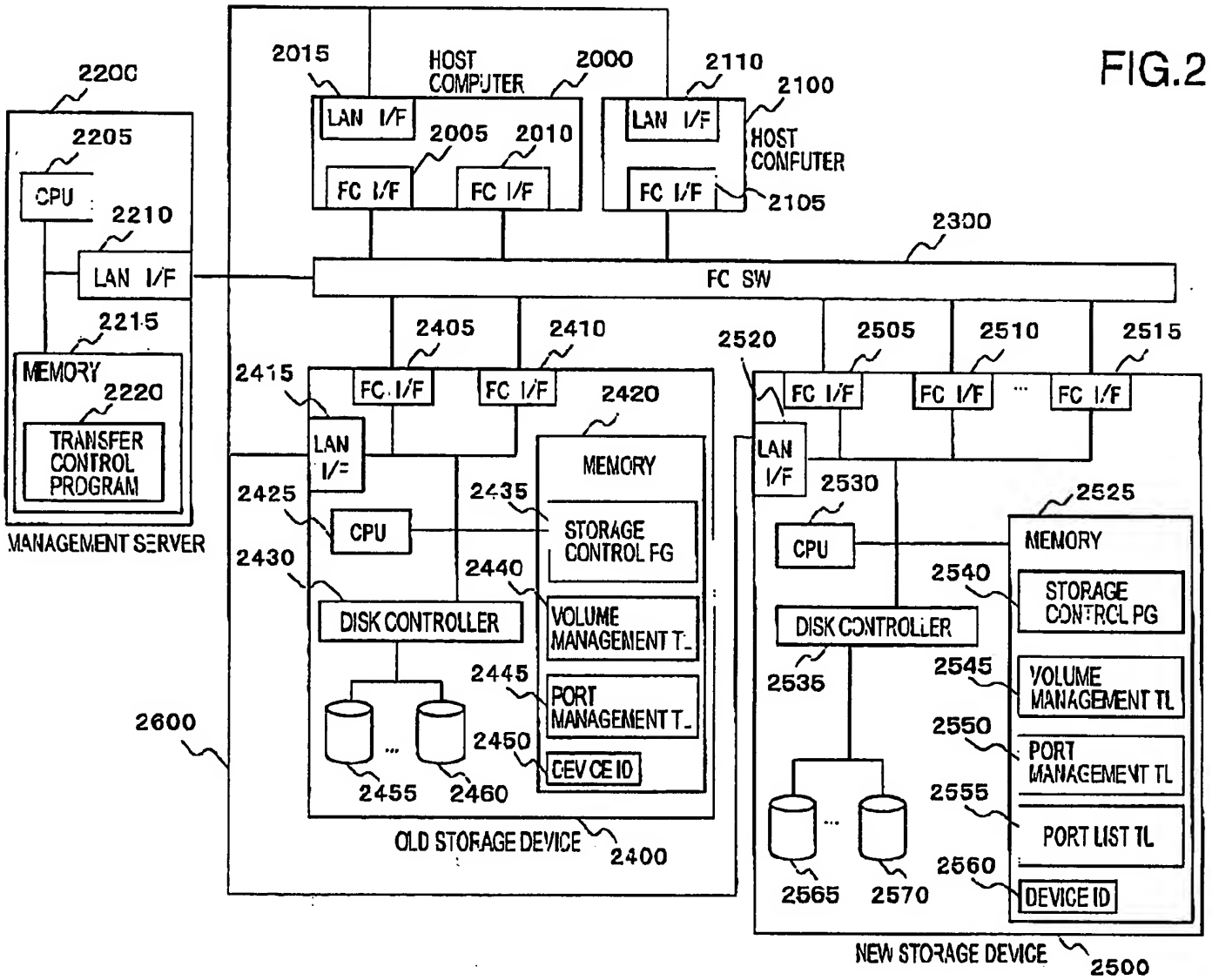

2200
2205
CPU
2210
LAN I/F
2215
MEMORY
2220
TRANSFER CONTROL PROGRAM
MANAGEMENT SERVER
2015
HOST COMPUTER
2000
LAN I/F
2005
2010
FC I/F
FC I/F
2110
2100
LAN I/F
HOST CONFUTER
FC I/F
2105
2300
FC SW
2405
2410
2520
2505
2510
2515
2415
FC I/F
FC I/F
2420
LAN I/F
MEMORY
2425
2435
CPU
STORAGE CONTROL PG
2430
2440
DISK CONTROLLER
VOLUME MANAGEMENT T_
2445
PORT MANAGEMENT T_
2600
2450
DEVCE ID
2455
2460
OLD STORAGE DEVICE
2400
FC I/F
FC I/F
FC I/F
LAN I/F
2530
2525
CPU
MEMORY
2540
STORAGE CONTRCL PG
DISK CONTROLLER
2535
2545
VOLUME MANAGEMENT TL
2550
PORT MANAGEMENT TL
2555
PORT LIST TL
2560
DEVICE ID
2565
2570
NEW STORAGE DEVICE
2500

FIG.3

VOLUME MANAGEMENT TL 2440

244005 VOLUME NUMBER	244010 VOLUME ID
1	Vol .1
2	Vol .2
3	Vol .3
4	Vol .4
:	:

FIG.4

PORT MANAGEMENT TL 2445

244505 PORT WWN	244510 LUN	244515 VOLUME ID	244520 ACCESS RESTRICTION	244525 ACCESS PERMISSION WWN
S1a	0	Vol .1	YES	H1a
	1	Vol .2	YES	H1b, H2
S1b	0	Vol .3	YES	H1a, H2
	1	Vol .1	YES	H1b
	2	Vol .4	YES	H1a, H2
:	:	:	:	:

FIG.5

PORT LIST TL 2555

255505 PORT WWN	255510 TYPE	255515 TARGET PORT PATH DEFINITION
S2a	TARGET	YES
S2b	TARGET	YES
S2c	TARGET	NO
S2d	TARGET	NO
S2e	INITIATOR	–
S2f	INITIATOR	–
S2g	INITIATOR	–
:	:	:

FIG.6

VOLUME MANAGEMENT TL 2545

254505	254510	254515	254520	254525	254530	254535	254540
VOLUME NUMBER	VOLUME ID	TYPE	INITIATOR PORT WWN	EXTERNAL PORT WWV	EXTERNAL CONNECTION LUN	EXTERNAL DEVICE ID	EXTERNAL VOLUME ID
1	Vol.1'	INTERNAL	–	–	–	–	–
:	:	:	:	:	:	:	:
N	Vol.N'	INTERNAL	–	–	–	–	–
N+1	Vol. N+1'	EXTERNAL	S2e	S1a	0	Storage1	Vol.1
			S2f	S1b	1		
N+2	Vol.N+2'	EXTERNAL	S2e	S1a	1	Storage1	Vol.2
N+3	Vol.N+3'	EXTERNAL	S2f	S1b	0	Storage1	Vol.3
N+4	Vol.N+4'	EXTERNAL	S2f	S1b	2	Storage1	Vol.4
:	:	:	:	:	:	:	:

FIG.7

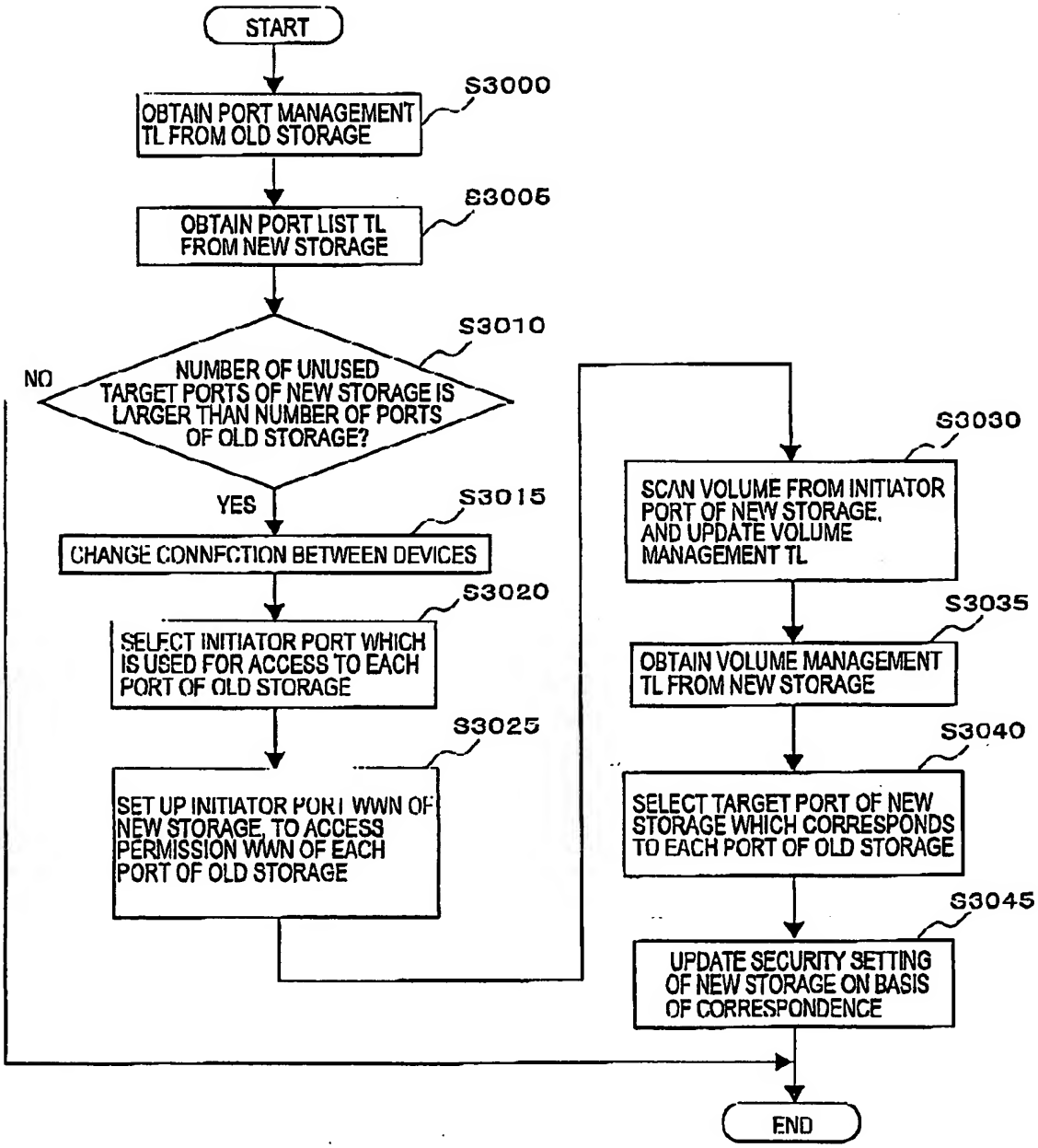

START
S3000
OBTAIN PORT MANAGEMENT TL FROM OLD STORAGE
S3005
OBTAIN PORT LIST TL FROM NEW STORAGE
S3010
NUMBER OF UNUSED TARGET PORTS OF NEW STORAGE IS LARGER THAN NUMBER OF PORTS OF OLD STORAGE?
NO
YES
S3015
CHANGE CONNECTION BETWEEN DEVICES
S3020
SELECT INITIATOR PORT WHICH IS USED FOR ACCESS TO EACH PORT OF OLD STORAGE
S3025
SET UP INITIATOR PORT WWN OF NEW STORAGE, TO ACCESS PERMISSION WWN OF EACH PORT OF OLD STORAGE
S3030
SCAN VOLUME FROM INITIATOR PORT OF NEW STORAGE, AND UPDATE VOLUME MANAGEMENT TL
S3035
OBTAIN VOLUME MANAGEMENT TL FROM NEW STORAGE
S3040
SELECT TARGET PORT OF NEW STORAGE WHICH CORRESPONDS TO EACH PORT OF OLD STORAGE
S3045
UPDATE SECURITY SETTING OF NEW STORAGE ON BASIS OF CORRESPONDENCE
END

FIG.8

CONNECTION CORRESPONDENCE TL 575

4000 INITIATOR PORT WWN	4005 EXTERNAL PORT WWN	4010 EXTERNAL CONNECTION LUN	4015 EXTERNAL DEVICE ID	4020 EXTERNAL VOLUME ID
S2e	S1a	0	Storage1	Vol.1
	S1a	1	Storage1	Vol.2
S2f	S1b	0	Storage 1	Vol.3
	S1b	1	Storage 1	Vol.1
	S1b	2	Storage 1	Vol.4
:	:	:	:	:

FIG.9

PORT MANAGEMENT TL 2550

244505 PORT WWN	244510 LUN	244515 VOLUME ID	244520 ACCESS RESTRICTION	244525 ACCESS PERMISSION WWN
:	:	:	:	:
S2c	0	Vol.N+1'		H1a
	1	Vol.N+2'		H1b, H2
S2d	0	Vol.N+3'		H1a, H2
	1	Vol.N+1'		H1b
	2	Vol.N+4'		H1a, H2
:	:	:	:	:

FIG.10

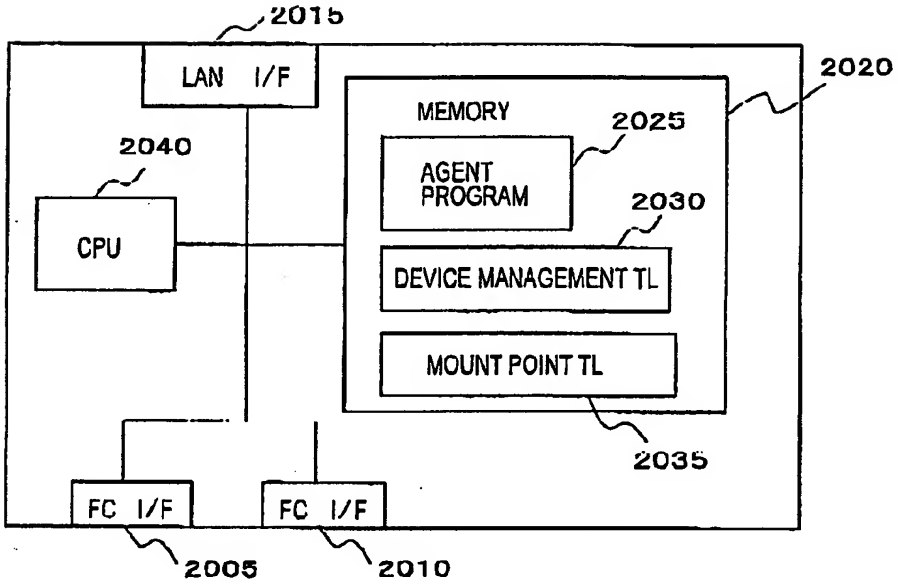


FIG.11

DEVICE MANAGEMENT TL 2030

203005 HOST WWN	203010 STORAGE WWN	203015 LUN	203020 DEVICE FILE
H1a	S1a	0	/dev/dsk/c0t0d0
	S1b	0	/dev/dsk/c0t1d0
H1b	S1a	1	/dev/dsk/c1t0d1
	S1b	1	/dev/dsk/c1t1d1
:	:	:	:

FIG.12

MOUNT POINT TL 2035

203505 DEVICE FILE	203510 MOUNT POINT
/dev /dsk /c0t0d0	/usr /bin
/dev /dsk /c0t1d0	/usr /chare
:	:

FIG.13

PORT MANAGEMENT TL 2550

244505 PORT WWN	244525 ACCESS PERMISSION WWN	244520 ACCESS RESTRICTION	244510 LUN	244515 VOLUME ID
S2a	Hx	YES	0	Vol.X
	Hy	YES	0	Vol.Y
:	:	:	:	:
S2c	H1a	YES	0	Vol.N+1'
	H1b, H2	YES	1	Vol.N+2'
S2d	H1a, H2	YES	0	Vol.N+3'
			2	Vol.N+4'
	H1b	YES	1	Vol.N+1'
:	:	:	:	:

FIG.14

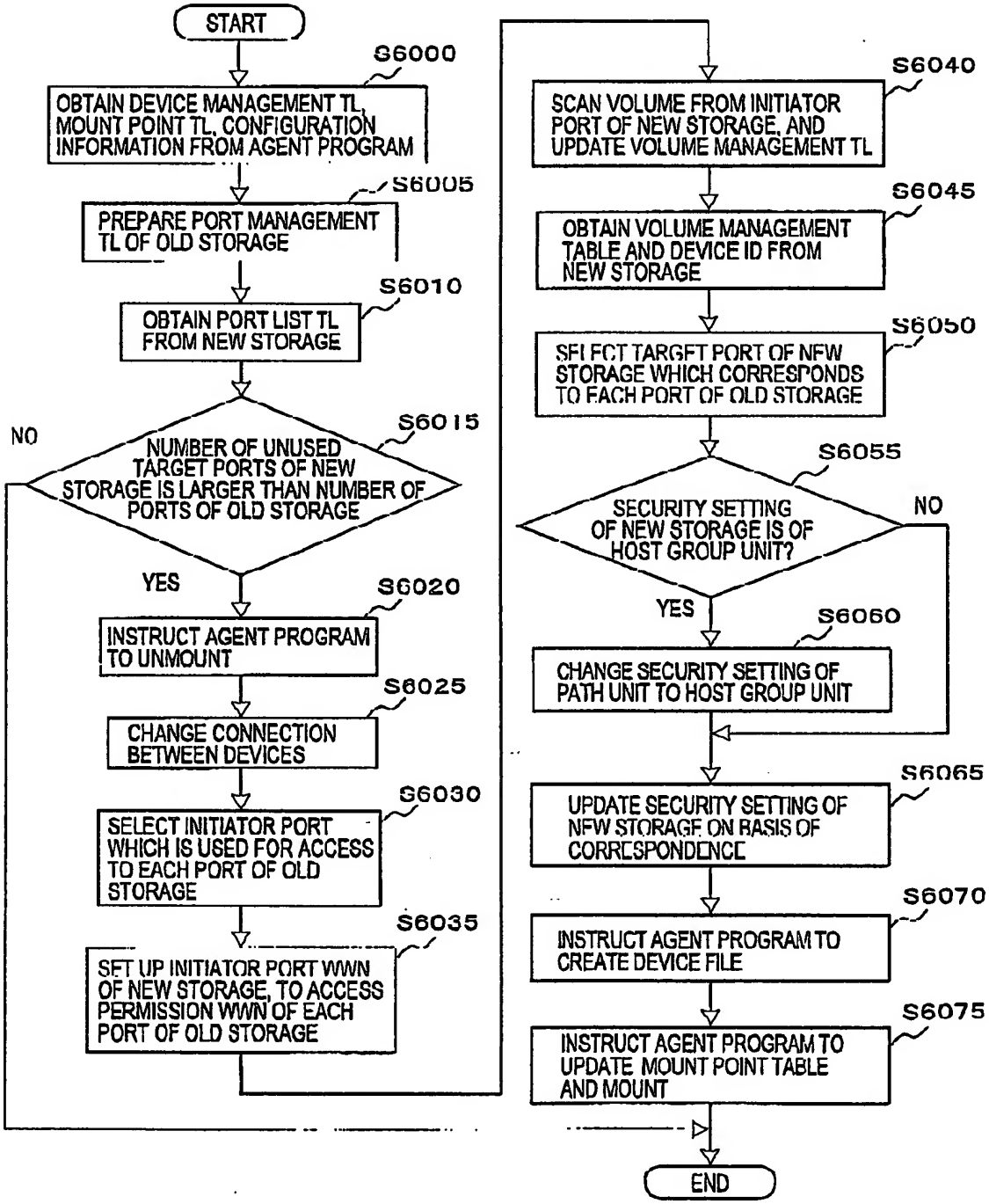

START
S6000
OBTAIN DEVICE MANAGEMENT TL, MOUNT POINT TL, CONFIGURATION INFORMATION FROM AGENT PROGRAM
S6005
PREPARE PORT MANAGEMENT TL OF OLD STORAGE
S6010
OBTAIN PORT LIST TL FROM NEW STORAGE
S6015
NUMBER OF UNUSED TARGET PORTS OF NEW STORAGE IS LARGER THAN NUMBER OF PORTS OF OLD STORAGE
NO
YES
S6020
INSTRUCT AGENT PROGRAM TO UNMOUNT
S6025
CHANGE CONNECTION BETWEEN DEVICES
S6030
SELECT INITIATOR PORT WHICH IS USED FOR ACCESS TO EACH PORT OF OLD STORAGE
S6035
SET UP INITIATOR PORT WWN OF NEW STORAGE, TO ACCESS PERMISSION WWN OF EACH PORT OF OLD STORAGE
S6040
SCAN VOLUME FROM INITIATOR PORT OF NEW STORAGE, AND UPDATE VOLUME MANAGEMENT TL
S6045
OBTAIN VOLUME MANAGEMENT TABLE AND DEVICE ID FROM NEW STORAGE
S6050
SELECT TARGET PORT OF NEW STORAGE WHICH CORRESPONDS TO EACH PORT OF OLD STORAGE
S6055
SECURITY SETTING OF NEW STORAGE IS OF HOST GROUP UNIT?
NO
YES
S6060
CHANGE SECURITY SETTING OF PATH UNIT TO HOST GROUP UNIT
S6065
UPDATE SECURITY SETTING OF NEW STORAGE ON BASIS OF CORRESPONDENCE
S6070
INSTRUCT AGENT PROGRAM TO CREATE DEVICE FILE
S6075
INSTRUCT AGENT PROGRAM TO UPDATE MOUNT POINT TABLE AND MOUNT
END

FIG.15

CONFIGURATION INFORMATION TL 5000

500005 HOST WWN	500010 STORAGE WWN	500015 LUN	500020 DEVICE ID	500025 VOLUME ID
H1a	S1a	0	Storage1	Vol .1
	S1b	0	Storage1	Vol .3
	S1b	2	Storage1	Vol .4
H1b	S1a	1	Storage1	Vol .2
	S1b	1	Storage1	Vol .1
H2	S1a	1	Storage1	Vol .2
	S1b	0	Storage1	Vol .3
	S1b	2	Storage1	Vol .4
:	:	:	:	:

FIG.16A

S1a

7000 LUN	7005 H1a	7010 H1b	7015 H2
0	O		
1		O	O

FIG.16B

S1b

7020 LUN	7025 H1a	7030 H1b	7035 H2
0	O		O
1		O	
2	O		O

FIG.17

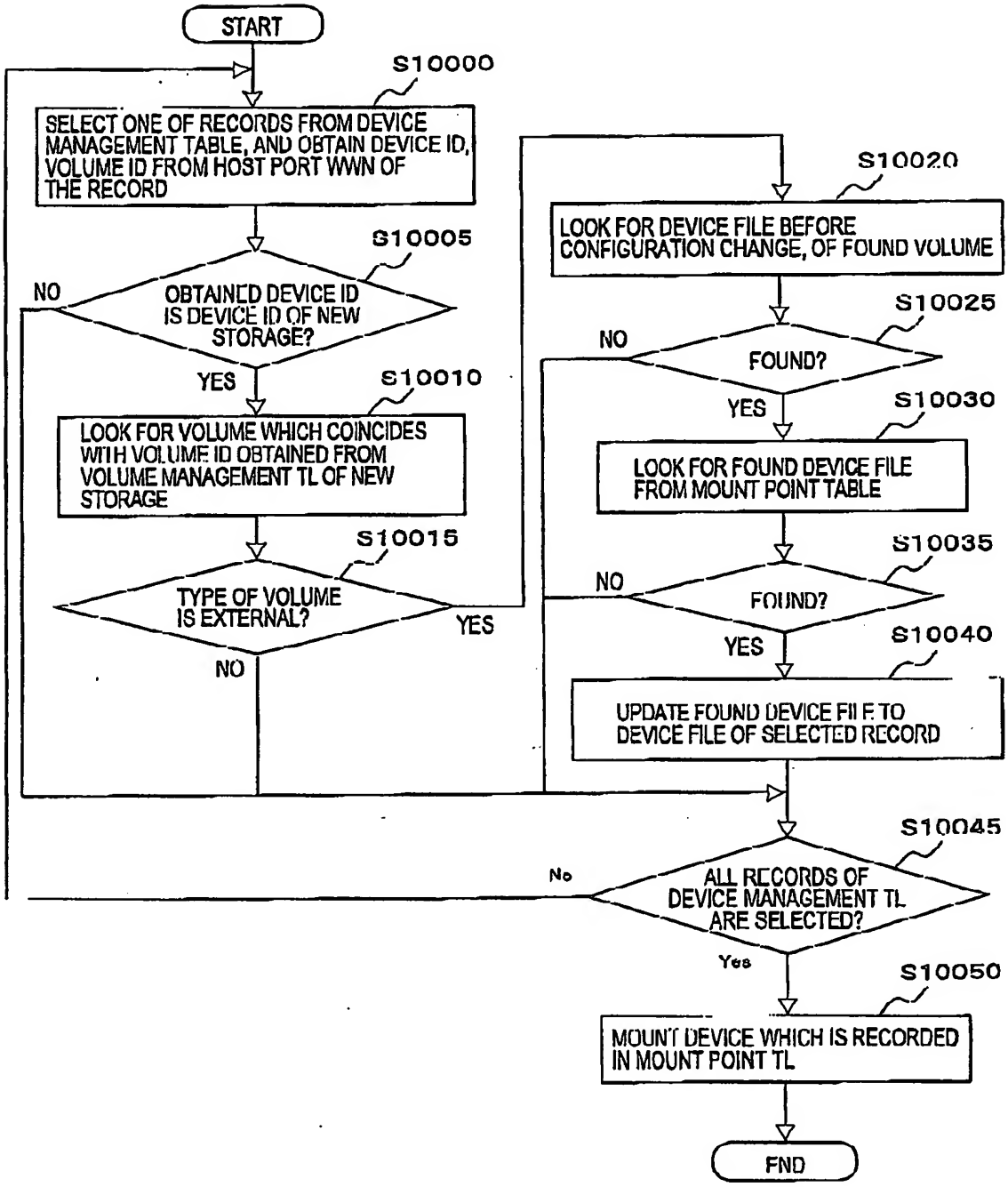

START
S10000
SELECT ONE OF RECORDS FROM DEVICE MANAGEMENT TABLE, AND OBTAIN DEVICE ID, VOLUME ID FROM HOST PORT WWN OF THE RECORD
S10005
OBTAINED DEVICE ID IS DEVICE ID OF NEW STORAGE?
NO
YES
S10010
LOOK FOR VOLUME WHICH COINCIDES WITH VOLUME ID OBTAINED FROM VOLUME MANAGEMENT TL OF NEW STORAGE
S10015
TYPE OF VOLUME IS EXTERNAL?
YES
NO
S10020
LOOK FOR DEVICE FILE BEFORE CONFIGURATION CHANGE, OF FOUND VOLUME
S10025
FOUND?
NO
YES
S10030
LOOK FOR FOUND DEVICE FILE FROM MOUNT POINT TABLE
S10035
FOUND?
NO
YES
S10040
UPDATE FOUND DEVICE FILE TO DEVICE FILE OF SELECTED RECORD
S10045
ALL RECORDS OF DEVICE MANAGEMENT TL ARE SELECTED?
No
Yes
S10050
MOUNT DEVICE WHICH IS RECORDED IN MOUNT POINT TL
END

FIG.18

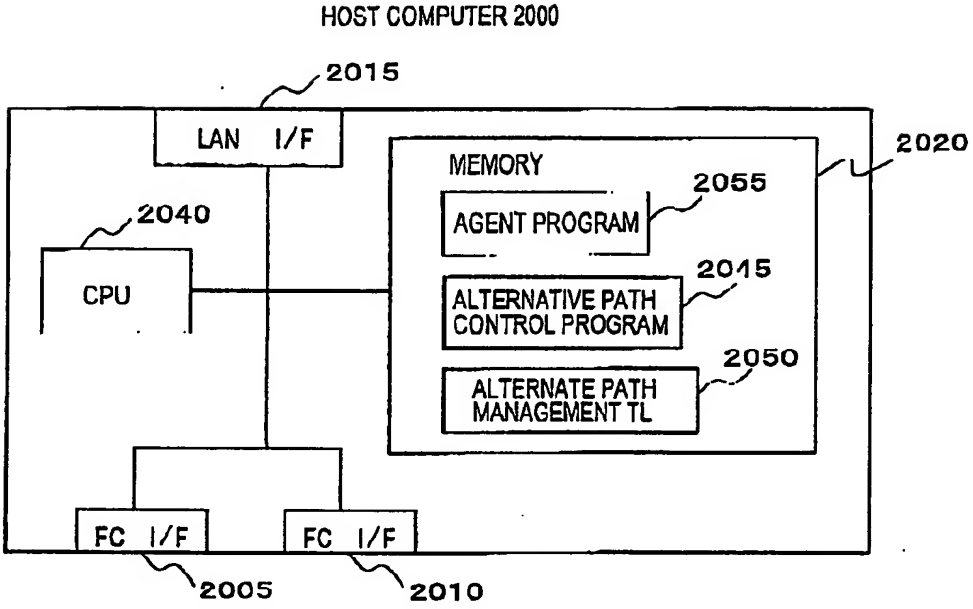
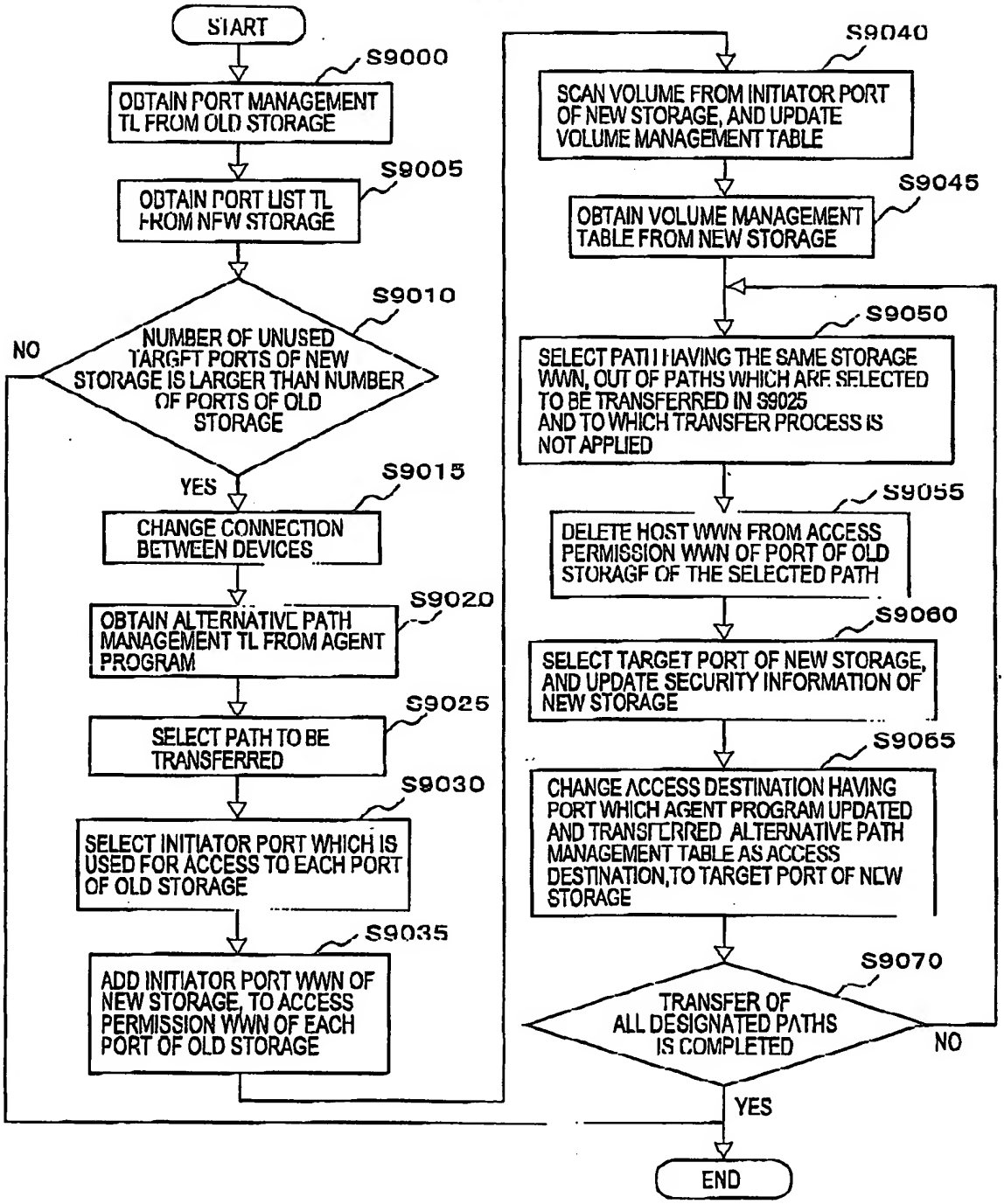


FIG.19

ALTERNATE PATH MANAGEMENT TL 2050

205005 PATH NUMBER	205010 HOST WWN	205015 STORAGE WWN	205020 LUN	205025 ALTERNATIVE PATH NUMBER
1	H1a	S1a	0	2
2	H1b	S1b	1	1
:	:	:	:	:

FIG.20


START
S9000
OBTAIN PORT MANAGEMENT TL FROM OLD STORAGE
S9005
OBTAIN PORT LIST TL FROM NEW STORAGE
S9010
NUMBER OF UNUSED TARGET PORTS OF NEW STORAGE IS LARGER THAN NUMBER OF PORTS OF OLD STORAGE
NO
YES
S9015
CHANGE CONNECTION BETWEEN DEVICES
S9020
OBTAIN ALTERNATIVE PATH MANAGEMENT TL FROM AGENT PROGRAM
S9025
SELECT PATH TO BE TRANSFERRED
S9030
SELECT INITIATOR PORT WHICH IS USED FOR ACCESS TO EACH PORT OF OLD STORAGE
S9035
ADD INITIATOR PORT WWN OF NEW STORAGE, TO ACCESS PERMISSION WWN OF EACH PORT OF OLD STORAGE
S9040
SCAN VOLUME FROM INITIATOR PORT OF NEW STORAGE, AND UPDATE VOLUME MANAGEMENT TABLE
S9045
OBTAIN VOLUME MANAGEMENT TABLE FROM NEW STORAGE
S9050
SELECT PATH HAVING THE SAME STORAGE WWN, OUT OF PATHS WHICH ARE SELECTED TO BE TRANSFERRED IN S9025 AND TO WHICH TRANSFER PROCESS IS NOT APPLIED
S9055
DELETE HOST WWN FROM ACCESS PERMISSION WWN OF PORT OF OLD STORAGE OF THE SELECTED PATH
S9060
SELECT TARGET PORT OF NEW STORAGE, AND UPDATE SECURITY INFORMATION OF NEW STORAGE
S9065
CHANGE ACCESS DESTINATION HAVING PORT WHICH AGENT PROGRAM UPDATED AND TRANSFERRED ALTERNATIVE PATH MANAGEMENT TABLE AS ACCESS DESTINATION, TO TARGET PORT OF NEW STORAGE
S9070
TRANSFER OF ALL DESIGNATED PATHS IS COMPLETED
NO
YES
END